Lesson 12-2

Example 1

Use roster notation to represent each complement.

$U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$ $A = \{1, 3, 5, 7, 9\}$ $B = \{2, 4, 6\}$

a. A'
b. B'

Solution

a. A' is the set of elements in U that are not in A.

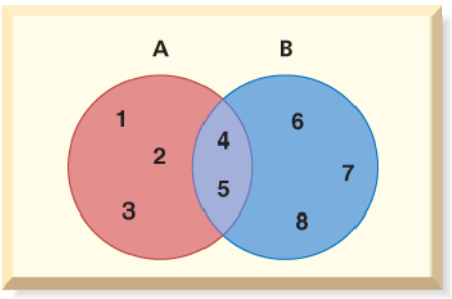
$A' = \{2, 4, 6, 8\}$

b. B' is the set of elements in U that are not in B.

$B' = \{1, 3, 5, 7, 8, 9\}$

Example 2

List the members of each set.



a. $A \cup B$

b. $A \cap B$

Solution

a. $A \cup B$ is the set of those elements that are in A, in B, or in both.

$A = \{1, 2, 3, 4, 5\}$ and $B = \{4, 5, 6, 7, 8\}$
$A \cup B = \{1, 2, 3, 4, 5\} \cup \{4, 5, 6, 7, 8\}$
$A \cup B = \{1, 2, 3, 4, 5, 6, 7, 8\}$

b. $A \cap B$ is the set of elements common to both A and B.

$A \cap B = \{1, 2, 3, 4, 5\} \cap \{4, 5, 6, 7, 8\}$
$A \cap B = \{4, 5\}$

Example 3

RECREATION At the beach one afternoon, Carrie collected the items defined by the set A = {conch shell, sand dollar, starfish}. Michael collected the items defined by the set B = {sand, seaweed, clamshell}. Find $A \cap B$.

Solution

A common item was not collected by either person, so the two sets are disjoint.
Therefore, $A \cap B = \varnothing$.